

Turkmenistan- Afghanistan-Pakistan (TAP) Natural Gas Pipeline Project

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Existing domestic networks and proposed international gaslines.

Background

- Current cooperation between Turkmenistan, Afghanistan, and Pakistan, began 30 May 2002
- Steering Committee comprising energy ministers of the three countries was established
- ADB invited to serve as lead development partner

ADB's Role

- **Facilitator:** promoting regional cooperation on energy security and supply
- **Honest Broker:** providing technical and financial assistance for developing member country (DMC) energy supply and energy security

ADB's Role

- ADB is a lender of last resort, and will not “crowd out” private sector
- Not married to specific gas transportation proposals: support for TAP is in response to requests from DMC countries
- ADB supporting parallel gas sector program in Afghanistan (TAs and loans)

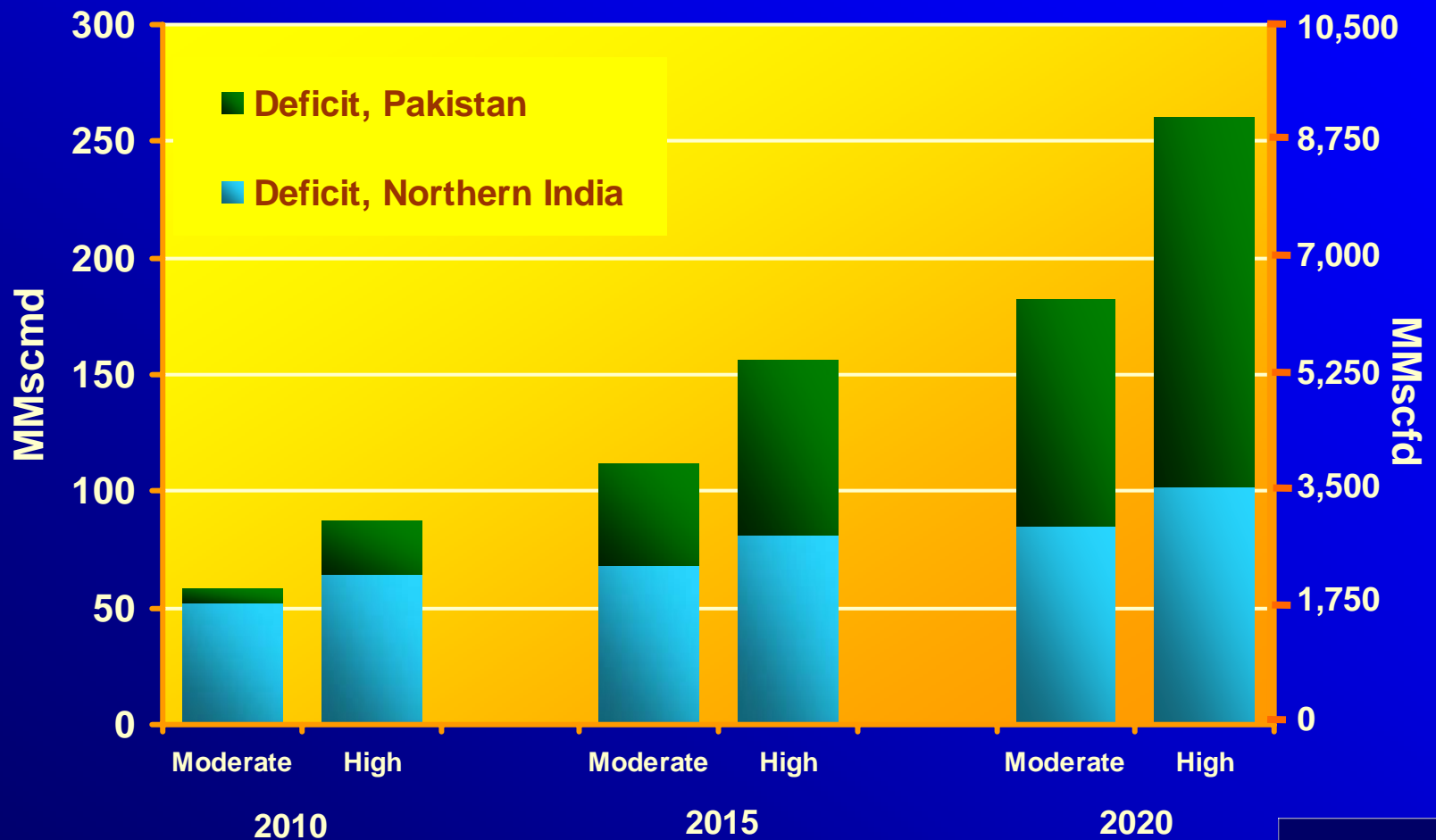
ADB Assistance

- Feasibility study (TA 6066-REG)
- Risk mitigation study
- Market study
- Pakistan gas import options study
- Underground storage (TA 6153-REG, complete by June 2006)
- “Desktop” security study (draft report to Steering Committee in December 2005)

ADB Assistance

- Framework Agreement (signed by Heads of State in August 2002)
- Model Host Country Agreement (to be renewed)
- Model Gas Sale and Purchase Agreement
- Model Gas Transportation Agreement
- Pre-qualification Documents for Private Sector Participation

Available Market for TAP Pipeline



TA 6066-REG Feasibility Study Findings

- Pipeline system design: 56-inch diameter, 1680 km length, 250 MW compression
- Capacity: 3.2 billion cubic feet per day (30 billion cubic meters per year, Bm³/y)
- Cost: \$3.3 billion
- FIRR: 15% +/- (using early 2005 range of border and end user prices)
- EIRR: 20-25% (based on moderate [3.8%] and high [4.6%] GDP growth rates*)

*Pakistan GDP growth exceeded 6% in 2003 & 2004

Pakistan import options

- Pakistan gas demand alone can support an import project (2 Bcf/d, 20 Bm³/y)
- piped gas economically favorable vs. LNG
- TAP and Iran-Pakistan-India options appear viable and competitive vs. LNG
- Qatar-Pakistan is economically unfavorable at present

Steering Committee Meeting # 8 – April 2005

- Techno-economic analysis report (TA 6066) accepted as “proof-of-concept” feasibility study
- Financial and Economic rates of return appear attractive based on early 2005 Turkmenistan border prices and Pakistan industrial/power prices

IRR -- March 2005 Price Envelope

			Gas input price, \$/MCM			
Gas sales price	\$/MCM		\$40	\$58	\$70	\$80
		60	10.6%	negative	negative	negative
		FIRR 71	15.0%	6.5%	negative	negative
		80	17.9%	11.2%	4.0%	negative
		EIRR 88.8	20.3%	14.7%	9.5%	2.5%
		100	23.0%	18.3%	14.3%	10.0%
		110	25.2%	21.0%	17.5%	14.1%

Sensitivity Results

Input Price in Turkmenistan		Market Price in Pakistan		FIRR%
\$/MCM	\$/MMBtu	\$/MCM	\$/MMBtu	
58	1.63	77.5	2.18	10.1
51	1.44	71.04	2	10.4

Gas Reserves – December 2003

Dauletabad Field:

Remaining reserves: 1.4 trillion cubic meters
(Tm³)¹

Current production: 20 billion m³/year (Bm³/y)

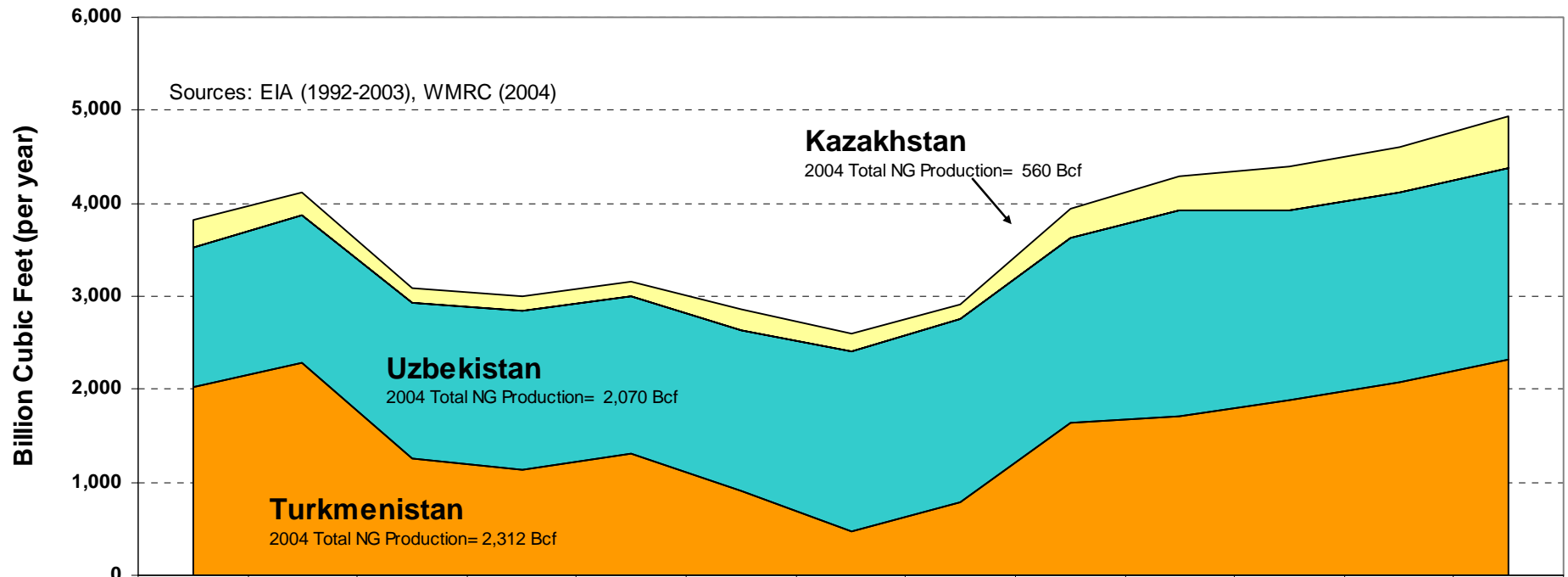
Production capacity: 45 Bm³/y

^[1] These are “geological” reserves, based on total gas in place, corresponding roughly to international definitions of “proven recoverable” plus “probable recoverable” plus “possible reserves.” Turkmenistan claims its total reserves are about 6 Tm³ (211 trillion cubic feet/TCF), the majority in the Caspian basin.

A 2003 US Department of Energy Report quoted proven recoverable gas reserves of 3 potential gas suppliers to Pakistan as follows: Turkmenistan - 2 Tm³ (71 TCF), Iran - 23 Tm³ (812 TCF), and Qatar - 14 Tm³ (494 TCF). The TAP Project as envisioned would consume about 1 Tm³ (35 TCF) over its 30-year lifetime.

Since year-end 2003, additional seismic surveys and drilling have added substantial new gas resources, which have yet to be confirmed by third-party reserves certification. In early November 2006, Turkmenistan announced discovery of a new gas field near Mary with estimated reserves of 7 trillion m³.

Fig. 2: Natural Gas Production in Central Asia (1992-2004)



	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004E
■ Kazakhstan	290	240	160	170	150	220	194	162	314	356	464	491	560
■ Uzbekistan	1,511	1,589	1,667	1,695	1,695	1,737	1,935	1,964	1,992	2,228	2,038	2,031	2,070
■ Turkmenistan	2,020	2,288	1,257	1,141	1,307	901	466	788	1,642	1,702	1,889	2,084	2,312



Existing domestic networks and proposed international gaslines.

Turkmen Export Options-- Alternate Project Values (NPV)

Project	Market Price (\$/MMBtu)	Pre-tax NPV (\$ million)	Pre-tax IRR (%)
x-Caspian - Turkey	2.44	2,074	19.5
x-Iran – Turkey	2.44	1,915	18.8
x-Russia – Turkey	2.44	612	21.6
Pakistan (TAP)	2.30	3,471	30.2
PRC	3.20	-114	11.8

Source: World Bank 1999
Assumes 20 Bm³/y pipeline

Turkmenistan Gas to Pakistan Competitive Advantage -- Indicative Cost of Delivering Gas to Pakistan (\$/MMBtu)

Source	Production Cost	Transport Cost	Delivered Cost
Turkmenistan	0.48	0.68	1.17
Kazakhstan	0.50	2.00	2.50
Iran offshore	0.60	1.90	2.50
Iran Onshore	0.60	1.37	1.97
Qatar offshore	0.50	1.64	2.14
Middle East LNG	0.55	2.60	3.15
SE Asia LNG	0.55	3.00	3.55

Source: World Bank 1999
Assumes 20 Bm³/y pipeline

Steering Committee Meeting #9 – February 2006

- India attended with “observer” status
- Reserves certification needs to be updated
- Technical group established for sub-ministerial work on reserves, pricing, gas supply and purchase agreements, etc.
- Invitation for India to formally join the project was reconfirmed
- Desk-top security study presented for review and discussion

Status as of year-end 2006

- Pakistan is examining all import options
– by 2016, projected import requirement is 2 BCF/day (20 Bm³/y)
- Pakistan plans to develop some LNG import capacity plus at least 1 pipeline
- TAP, IPI, and Qatar-Pakistan are all still under consideration
- India expected to formally join TAP

CHALLENGES

Political –

- Turkmen commitment to develop new export projects
- US sanctions regime vs. Iran
- Pakistan-India relations

Financial and Economic –

- Private sector interest?
- Phase-out of fuel price subsidies in India
- Long-term competition with LNG

Thank you!

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